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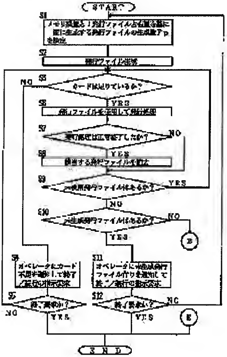
(54) ISSUING PROCESSING SYSTEM



(57)Abstract:
PURPOSE: To smoothly perform a processing under the restriction of a limited main memory even in the issue of a large quantity of cards by deleting pertinent issuing files which are used for the issue of the card when a processing result is normally terminated and by leaving the issuing files when the result is abnormally terminated.

CONSTITUTION: When a card automatic carrier issuing device normally terminates a prescribed processing such as a siting, etc., by using the issuing file extended on a main memory (S7), the used issuing files are deleted and memory capacity is made empty (S8). If the processing is not normally terminated, the used issuing files are not deleted and are left for the use of a subsequent reissue (S7). When all the issuing files extended on the main memory are used and the remaining files become only processing abnormalities, this matter is notified to an operator and terminated or remaining issuing files not yet generated are generated in the main memory in accordance with the next operation instruction and a prescribed processing is repeated (S9 to S12). Thus, a smooth processing is performed.

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(54) [Title of the Invention]

ISSUE PROCESSING SYSTEM

(57) [Abstract]

[Object]

In an issue processing system which writes data into a magnetic card, IC card or the like, a smooth operation is implemented under the constraint of a limited main memory included in a host computer.

[Constitution]

There is provided an issue processing system including a card processing unit that automatically conveys a card and performs predetermined processings of writing and the like and a control unit that prepares writing data and processing content for each card in the form of an issue file, sends the issue file to the card processing unit, so that the predetermined processings are executed, and controls the whole issue processing. When all the issue files needed for

processings of a group of cards cannot be stored in the memory, the number of issue files is decreased to a value or less which matches the memory capacity, according to the remaining memory capacity of the control unit. When the issue processing terminates normally using the issue file, that issue file is deleted so that the idle memory capacity increases, and when all the issue files are used, it is determined according to a command from the operator whether the processing is to be terminated or to be carried on using the remaining issue files to be produced.

[Claims for the Patent]

[Claim 1]

An issue processing system comprising: a host computer acting as control means which includes a main memory of limited capacity and which successively performs writing and the like of different individual data for each card with information storage means such as a magnetic card or IC card; and an automatic conveying issue apparatus acting as card processing means which automatically conveys a card and performs a write processing and the like, the system characterized in that said control means:

(A) preliminarily produces one or more issue file containing information needed for an issue processing of each card in a remaining memory capacity of the main memory;

(B) sends the issue file to said card processing means;

(C) receives from said card processing means a processing result of said card processing means performing predetermined processings of writing and the like, and deletes the issue file used to issue the card when the processing result is of normal termination, or leaves the issue file when the processing result is of abnormal termination;

(D) repeats the above steps (B) and (C) until the number of cards to be processed mounted in said card processing means becomes zero, or until all the issue files to be processed stored in the main memory are used and there remains only an issue file left due to abnormal termination; and

(E) terminates the issue processing when all the needed issue files have been produced in step (A), or when the number of issue files which have been produced in step (A) is small compared to the number of all the needed issue files and there are issue files not yet produced, notifies an operator of absence of card when there is shortage of card, or of presence of issue files not yet produced when there are issue files not yet produced, and continues or terminates the issue processing according to a command from the operator.

[Claim 2]

The issue processing system according to claim 1, characterized in that said control means sets an issue file corresponding to card identification information sent from said card processing means as the issue file to be sent to said card processing means.

[Claim 3]

The issue processing system according to claim 1 or 2, characterized in that said control means writes, with respect to a produced issue file, issue file production completion information into an appropriate individual record of an individual data file used to produce the issue file, or writes issue file production completion information into an individual information file containing record identification information corresponding to record identification information of the individual data file.

[Claim 4]

The issue processing system according to claim 1, 2 or 3, characterized in that, when the operator specifies one from among a plurality of issue objects, said control means performs the issue processing with respect to the specified issue object.

[Detailed Description of the Invention]

[0001]

[Industrial Application Field]

The present invention relates to an issue processing system which performs an issue processing of successively writing data into multiple cards having an information storage function, such as a magnetic card or IC card, and which includes a host computer and an automatic conveying issue apparatus, and more particularly to an issue processing system which can implement a smooth operation under the constraint of a limited main memory included in the host computer.

[0002]

[Conventional Art]

For example, when a card such as a magnetic card, IC card or memory card is issued, an automatic card conveying issue apparatus performs an issue processing of writing desired data into each card. Typically, the automatic card conveying issue apparatus includes: card access means for sending or receiving information to/from a card, examples of the card access means including an IC card reader/writer used for IC card, optical card reader/writer used for optical card and magnetic card reader/writer used for magnetic card; automatic card conveying means for sequentially and successively supplying and discharging a card to/from the card access means; and when needed, card identification means for reading card identification information of the processed card. Each means included in the automatic card conveying issue apparatus performs a single function and is limited to its main processing; the means are not suitable for preparation for producing data to be written into each card, nor for management and the like of the prepared data.

[0003]

Thus, typically, data to be written and the other information needed for the issue processing are preliminarily prepared in the format of an issue file in which the above data and information are integrated on a per card basis in the host computer, and the issue file is appropriately sent to the automatic card conveying system; the above management for the issue file is sequentially performed by the host computer to implement the issue processing. The reason for this is that when the issue file management is conducted by the host computer side excellent in arithmetic processing speed, the load of the card automatic card conveying issue apparatus side of a single function can be reduced, so that the whole issue processing can be performed more smoothly. For example, as the data written into each card on a per card basis, in the case of a member card, in addition to common data such as the name of card issuing organization, there are many pieces of data different between each card such as personal ID number, personal name, address and telephone number. Accordingly, when these pieces of data are preliminarily integrated, the processing becomes more efficient. Particularly, in the processing of issuing a card capable of storing a large amount of information, such as IC card and optical card, which is expected to grow popular due to its excellent function, since the amount of information to be written is large, the preliminary preparation of information needed for the processing in the format of an issue file is indispensable for smoothed operation.

[0004]

Further, in the issue processing of writing information into a card in which personal ID number, personal name and the like are preliminarily formed as visible information, the following processings must be performed: this card identification information is acquired by the card identification means; an issue file corresponding to the acquired card identification information is accessed; and an issue processing is performed using the accessed issue file. In this way, when file access is needed, also, in order to reduce the delay in the whole issue processing dependent on access time, it is advantageous to preliminarily prepare needed information as an issue file. Further, when the original data is accessed before producing an issue file and thereafter these pieces of data are integrated to produce the issue file, a smooth operation cannot be implemented. Particularly, in order to speed up the data access and after the data access, immediately send the issue file to the card automatic card conveying issue apparatus, the operation is performed with all the processed issue files not stored in a supplementary storage unit of the host computer but deployed in the main memory thereof.

[0005]

Here, the reason for the above described issue processing will be further described by taking IC card as an example. IC card includes a CPU in the interior thereof, so most of the processings such as data writing and reading are performed in the form of a command to the internal CPU. In the case of writing data, an IC card reader/writer integrates a command code of writing data with prescribed data, and sends the data as a command to the IC card. Then, the IC card sends back a result of execution according the command by the internal CPU to the reader/writer in the form of a response. The reader/writer compares the actually sent response with a response which is to be sent back if the result of execution by the internal CPU is correct, and thereby checks whether or not this sent command has been executed normally, whereby one write processing is completed. Also, in the case of reading data, when a read command is sent, the IC card sends back data in the form of a response.

[0006]

In this way, various types of IC card processings are performed by a pair of command and appropriate response. When multiple pieces of data are written, sending of command and response check are alternately executed each time one set of data is written. Typically, a sequence of commands and responses used for the processings are preliminarily prepared as an issue file and then sequentially sent from the host computer to the card automatic card conveying issue apparatus, whereby the issue processing is performed.

[0007]

The operation of preliminarily preparing such issue file will be described by taking as an example a case where a client being a card issuing organization orders a process company actually performing card issuing processings to conduct the processing of issuing a personal card. Personal information including ID number, personal name, address and telephone number to be written into each card are handed as a personal information file being an individual data file to the process company. Information unique to the ordering client is also written into a sequence of the ordered card groups, so such client information is also provided for the process company. Further, in order to cause the automatic card conveying issue apparatus to perform a prescribed processing with respect to this client information in the processing of issuing a sequence of the card groups, the process company also prepares, as a parameter file, processing information used to set the processing conditions of the card automatic card conveying issue apparatus. An issue file is produced using these pieces of information. However, the required format is different between card reader/writers included in the automatic card conveying apparatus; and individual information, client information and the like are provided in different formats from the clients. Thus, when an issue file is produced on a case-by-case basis depending on the reader/writer or client, the operating efficiency is reduced. Accordingly, an issue file production pattern file acting as a model used to define an issue file production format is produced once, and then an issue file is efficiently produced using this pattern file. Here, this pattern file is shared among a sequence of the card groups, being common information in the issue processing of the group of cards. Thus, the parameter file being common information in the issue processing of a sequence of the card groups, and containing processing information used to set the processing conditions of the automatic card conveying issue apparatus, and the issue file production pattern file, are integrated and used as an issue information file, so that the efficiency of the file operation is increased. Consequently, when a client orders a card issue processing operation, the issue processing information unique to the client has been preliminarily integrated in the client information file being the issue information file. And the personal information file being the individual information file including the original data of individual information different between each card, and the client information file being the issue information file are used to produce an issue file.

[0008]

[Problems to be Solved by the Invention]

As described above about the production of an issue file for IC card, the issue file production operation actually is not such a simple process.

Accordingly, as the card function becomes more advanced and the written data becomes more voluminous and more complex, preliminary production of an issue file is more advantageous, but this issue technique using an issue file also has a problem. That is, as the issue processing becomes complex, the file size of one issue file needed for each card becomes larger; thus all the issue files used in issuing a sequence of card groups occupies a significantly large memory capacity. Particularly, when many cards are issued all at once, the memory capacity occupied by all the issue files used is significantly large, so it is actually impossible, due to the physical limitation of memory capacity, to preliminarily prepare all the needed issue files on the main memory of host computer. Accordingly, in the case of a mass issue or the like, a part of the needed issue files must be deployed on the main memory, so a smooth issue operation cannot be implemented.

Thus, an object of the present invention is to provide an issue processing system which can implement a smooth operation under the constraint of a limited main memory even when many cards are issued. Another object of the present invention is to provide an issue processing system which allows prevention of reusing of an individual data file already used, and handling and the like of multiple issue objects.

[0009]

[Means for Solving the Problems]

To achieve the above object, according to the present invention, there is provided an issue processing system including: a host computer acting as control means which includes a main memory of limited capacity and which successively performs writing and the like of different individual data for each card with information storage means such as a magnetic card or IC card; and an automatic conveying issue apparatus acting as card processing means which automatically conveys a card and performs a write processing and the like, the system characterized in that said control means (A) preliminarily produces one or more issue file containing information needed for an issue processing of each card in a remaining memory capacity of the main memory, (B) sends the issue file to said card processing means, (C) receives from said card processing means a processing result of said card processing means performing predetermined processings of writing and the like, and deletes the issue file used to issue the card when the processing result is of normal termination, or leaves the issue file when the processing result is of abnormal termination, (D) repeats the above steps (B) and (C) until the number of cards to be processed mounted in said card processing means becomes zero, or until all the issue files to be processed stored in the main memory are used and there remains only an issue file left due to abnormal termination, and (E) terminates the issue processing when all the needed issue files have been produced in step (A), or when the number of issue files which have been produced in step (A) is small compared to the number of all the needed issue files and there are issue files not yet produced, notifies an operator of absence of card when there is shortage of card, or of presence of issue files not yet produced when there are issue files not yet produced, and continues or terminates the issue processing according to a command from the operator.

[0010]

Also, the issue processing system is characterized in that: said control means sets an issue file corresponding to card identification information sent from said card processing means as the issue file to be sent to said card processing means; said control means writes, with respect to a produced issue file, issue file production completion information into an appropriate individual record of an individual data file used to produce the issue file, or writes issue file production completion information into an individual information file containing record identification information corresponding to record identification information of the individual data file; and when the operator specifies one from among multiple issue objects, said control means performs the issue processing with respect to the specified issue object.

[0011]

[Operation]

According to the inventive issue processing system, when the memory capacity occupied by all the issue files needed for issue processings of a group of cards exceeds the remaining main memory capacity which can be used, division is performed by the host computer so that the production is performed with respect to issue files of a number obtained by division into a range not exceeding the remaining memory capacity. And when the automatic card conveying issue apparatus terminates predetermined processings of writing and the like by use of the issue files deployed on the main memory, the used issue files are deleted so that the idle memory capacity increases. When the proceeding has not terminated normally, the used issue file is not deleted so that it is used later for reissue. In this way, when all the issue files deployed on the main memory have been used and there are left only issue files for which the processing has terminated abnormally, then the operator is notified of this, so that the processing is terminated according to a subsequent operating command, or the issue files to be produced are produced on the main memory and the above processing is repeated. When there occurs shortage of card in the middle of processing, the operator is also notified of this, so that the processing is terminated according to a subsequent operating command, or the processing continues. Thus, a smooth issue operation is implemented under the constraint of a limited main memory of the host computer.

[0012]

When card identification information such as ID number has already been attached as visible information (for example, print display) or invisible information (for example, magnetic storage medium in a case where magnetic storage medium and IC memory are used in combination) to a card for which the issue processing is to be performed, the host computer accesses an issue file corresponding to card identification information detected and sent by the automatic card conveying issue apparatus to specify an issue file to be used and sends the issue file to the automatic card conveying apparatus; thus another issue file not corresponding to the card identification information is prevented from being used. Also, with respect to the produced issue files, information of "production completion" is written in an appropriate record of an individual data file used as the source from which the issue file has been produced, thereby ensuring that an issue file already produced is prevented from being produced again by mistake for the issue processing. As the file in which the information of "production completion" is written, aside from individual data file, there may be used another file including record identification information corresponding to the record identification information of individual data file, for example, a production history file (provisional name) in which a record in which only the information of "production completion" is stored has one-to-one correspondence with the record of individual data file. With respect to multiple issue objects, also, when one is appropriately selected from among them, the issue processing is performed.

[0013]

[Embodiment]

An embodiment of an issue processing system according to the present invention will be specifically described below with reference to Figures 1, 2, 3 and 4. In the inventive issue processing system, a computer is used as control means, and a known automatic card conveying issue apparatus is used as card processing means for actually performing processings such as writing into a card. Figure 1 illustrates a basic procedure of processing centered at the host computer being the control means in the issue processing system according to the present invention.

[0014]

Referring to Figure 1, the first process of step 1 determines the number Fp of issue files to be produced all at once. The remaining memory capacity of the main memory included in the host computer is checked, and the area occupied by one issue file on the main memory is estimated or determined by temporary production, and the number Fp is basically determined by dividing the former by the latter. In this case, a number roughly selected such as a multiple of 10 may be used as the number Fp, and a maximum number calculated from the remaining main memory capacity does not need to be used. Subsequently, in step 2, issue files of the number Fp determined in step 1 are produced on the main memory.

[0015]

In step 3, before an issue processing is performed using the produced issue file, it is checked first whether or not there is shortage of card. If there is shortage of card, the flow proceeds to step 4. In step 4, the operator is notified of the shortage of card, and a request is made to the operator to determine whether the processing is terminated at this step or carried on after supplying of cards. Subsequently, in step 5, if the operator makes a termination request, the processing is terminated at this step. If the operator makes a request to continue the processing, the flow returns to step 3 to continue the processing.

[0016]

Subsequently, in step 6, the host computer sends the issue file to the automatic card conveying issue apparatus to cause predetermined processings of writing and the like to be performed. The automatic card conveying issue apparatus writes prescribed data into a card by use of the received issue file, and thereafter conveys the card to a predetermined holding position, and when it is determined that all the processings of writing, holding and the like have been terminated normally, sends to the host computer a result of normal termination of the processings. In this case, instead of sending the result after completion of all the processes, the result may be sent each time an individual processing is performed.

[0017]

In step 7, the host computer determines based on the information on process result sent from the automatic card conveying issue apparatus whether or not the issue processing has been performed normally. If the issue processing has terminated normally, the flow proceeds to step 8; if the issue processing has terminated abnormally, step 8 is skipped and the flow proceeds to step 9. If the issue processing has terminated normally, in step 8, the issue file used in the issue processing is deleted from the main memory.

[0018]

Subsequently, in step 9, it is checked whether or not there is still an unused issue file on the main memory. In this case, there is also an issue file left due to abnormal termination on the main memory, so in order to prevent this issue file from being used again, the checking is performed with respect to only an unused issue file. If there is an unused issue file, since the issue processing must be carried on, the flow returns to step 3, so that the processing is repeated. Then, when there is no unused issue file left, the flow proceeds to step 10.

[0019]

In step 10, since all the issue files to be used deployed on the main memory have been used, it is checked whether or not there is still an issue file needed for a sequence of the issue processings, i.e, whether or not there is still an issue file to be produced. If there is no issue file to be produced, this means that all the issue processings are completed; thus a sequence of the issue processings are completed. If there is an issue file to be produced, the issue processing may be carried on, so the flow proceeds to step 11. In step 11, the operator is notified that there is still an issue file to be produced, and a request is made to the operator to determine whether the issue file to be produced is actually produced to carry on the issue processing, or the issue file left due to abnormal termination is used to carry on the issue processing as a reissue processing, or the issue processing is terminated at this step. In step 12, if it is determined that the operator has made a request to terminate the processing, the processing is terminated at this step. If the operator has made a request to continue the processing, the flow returns to step 1 to continue the processing. Referring to the flowchart of Figure 1, when the proceeding is carried on, the flow returns to step 1; but when the issue file left due to abnormal termination is used to carry on the issue processing as a reissue processing, the flow returns to step 3.

[0020]

In this way, in the inventive issue processing system, a smooth issue operation is implemented under the constraint of a limited main memory included in the host computer. The above processing procedure will be described more specifically with reference to flowcharts of Figures 2 and 3, by taking as an example a case where card identification information is preliminarily attached to a card to be processed.

[0021]

First, in step 101, the number Ft of all issue files needed is checked. In producing an issue file, individual information different between each issued card is produced based on information stored in an individual data file; thus the number Ft of all issue files can be checked from the number of the original individual data file records. Alternatively, the number Ft may be provided as client information from the client who has ordered the issue of a sequence of card groups. Also, instead of issuing cards with respect to all records of the individual data file, a part of the records may be excluded in some cases; in this case, exclusion information may be provided as client information. In view of the above, the number Ft of all issue files is determined.

[0022]

Subsequently, in step 102, the remaining memory capacity Mo of the main memory capable of being used for issue files is checked. When an issue file is produced once and an issue processing is performed, an issue file of a card for which the processing has terminated abnormally is left behind; thus there is no guarantee that the remaining memory capacity at the time of the first production agrees with that at the time of the second or subsequent production. Accordingly, the checking is performed on a production-by-production basis.

[0023]

In step 103, the remaining memory capacity Mo is divided by issue file memory occupation quantity Mf to determine the maximum number of issue files which can be produced. Particularly, when there is no additional restriction, the number Fp of issue files to be produced is set as this maximum number. Subsequently, in step 104, issue files of the number Fp are produced on the main memory.

[0024]

Here, the expression "an issue file is produced on the main memory" as used in the present invention means that an issue file is deployed on the main memory. Accordingly, the deployment of an issue file on the main memory, and the actual production of an issue file format by use of the original data including individual data file and processing information file are not always performed simultaneously. With the issue file production area being the main memory, the deployment and the production may be simultaneously performed. Alternatively, the deployment and the production may be performed at separate timings; in this case, after all the needed issue files are produced by another apparatus and then stored once in a supplementary storage medium of the host computer, and needed issue files are sequentially deployed on the main memory. In the latter case, issue files may be sequentially produced by another apparatus and appropriately deployed via communication directly on the supplementary storage medium or the main memory of the host computer.

[0025]

In step 105, the number of remaining issue files to be produced is calculated. The number Ft of all issue files needed is updated using a value obtained by subtracting the number Fp of issue files produced from the number Ft of all issue files needed. Here, the term "Ft" also means the number of remaining issue files to be produced. In step 106, the number Fp of issue files on the main memory which have already been produced but not used yet is checked. Here, it is taken into consideration that when the issue processing is interrupted due to shortage of card or the like while the issue processing is performed using the produced issue files, the produced issue files left on the main memory are not deleted, and used when the processing restarts. Then, in step 107, issue processing counter P is set so that P = Fp + Fq. The issue files of the number Fq of issue files already produced but not used yet are also issue processing objects.

[0026]

In step 108 (hereinafter, refer to Figure 3), in performing the issue processing using the produced issue files, first, it is checked whether or not there is shortage of card. If there is shortage of card, the flow proceeds to step 109. In step 4, the operator is notified of shortage of card, and a request is made to the operator to determine whether the processing is terminated at this step or carried on after supplying of cards. In step 110, if the operator's command is of termination request, the processing is terminated at this step; if the operator requests that the processing be carried on, the flow returns to step 108, so that the processing is carried on.

[0027]

In step 111, the automatic card conveying issue apparatus sends to the host computer, card identification information acquired by the card identification means included in the apparatus. In step 112, the host computer selects an issue file corresponding to the received card identification information from among the issue files deployed on the memory, and sends that issue file to the automatic card conveying apparatus and gives a command of executing predetermined processings. In this case, when there is no issue file corresponding to the received card identification information, and when this trouble occurs sporadically, the card identification information preliminarily attached to the card may be incorrect due to mistaken recording or the like, so this is handled as abnormal termination; when the trouble occurs successively with respect to multiple cards, this would seem to suggest that the wrong card supplying magazine has been mounted, and the operation may be forcibly stopped.

[0028]

In step 113, since an issue file has been sent, the issue processing counter P is decremented. Then, in step 114, the automatic card conveying issue apparatus performs predetermined processings of writing and the like by use of the issue file, conveys the card to a prescribed position and holds it. In step 115, the host computer receives a result of processings of writing, card holding and the like from the automatic card conveying apparatus.

[0029]

In step 116, the host computer determines based on the processing result sent back from the automatic card conveying apparatus whether or not the issue processing has been performed normally. If the issue processing has terminated normally, the flow proceeds to step 117; if the issue processing has terminated abnormally, step 117 is skipped and the flow proceeds to step 118. In step 117, since the issue processing has terminated normally, the issue file used in that issue processing is deleted from the main memory.

[0030]

In step 118, it is checked whether or not there is still an issue file not yet used on the main memory (whether or not issue processing counter $P > 0$). If there is an unused issue file, the issue processing must be carried on, and thus the flow returns to step 108, so the processing is repeated. Then, when the number of unused issue files changes to 0, the flow proceeds to step 119.

[0031]

Finally, in step 119, since all the issue files to be used deployed on the main memory have been used, it is checked whether or not there is still left an issue file for which the issue processing is to be performed, i.e, whether or not there is an issue file to be produced (the number Ft of remaining issue files to be produced > 0). If there is no issue file to be produced, this means that all the issue processings are completed, so a sequence of the issue processings are completed; if there is an issue file to be produced, this means that the issue processing may be carried on, so the flow proceeds to step 120.

[0032]

In step 120, the operator is notified that there is still an issue file to be produced, and a request is made to the operator to determine whether the issue file to be produced is actually produced to carry on the issue processing, or the issue file left due to abnormal termination is used to carry on the issue processing as a reissue processing, or the issue processing is terminated at this step. Then, in step 121, if the operator's command is of termination request, the processing is terminated at this step; if the operator requests that the processing be carried on, the flow returns to step 102, so that the processing is carried on. Referring to the flowchart of Figure 2, when the proceeding is carried on, the flow returns to step 102; but when only the issue file left due to abnormal termination is used to carry on the issue processing as a reissue processing, the flow returns to step 107. In this case, Fp is set to 0, thus Fq = the number of issue files left due to abnormal termination. Also, when a new issue file is further produced on the idle main memory area and the issue processing is performed for the issue files including this, the processing is repeated from step 102 as illustrated in Figure 2 with Fq being equal to the number of issue files left due to abnormal termination.

[0033]

In this way, when card identification information is preliminarily attached to a card to be processed, also, a smooth issue operation is implemented. Finally, the procedure of processing of the inventive issue processing system which can select one from among multiple clients ordering an issue processing, uses the appropriate individual data file and also output a processing result as a history, will be described with reference to Figure 4.

[0034]

First, in step 201, a client is selected. Processing information files and the like of each of several clients or of each manufacturing lot are preliminarily stored in the host computer. In this step, an object for which the issue processing is to be performed is selected from among these for the system. Subsequently, in step 202, the host computer selects based on the input client instruction, the appropriate client information file and a personal data file associated with the client information file. Here, the client information file is a type of issue information file, and the individual data file is a type of individual data file.

[0035]

In step 203, it is checked whether or not the selected client information file and individual data file have a correspondence relationship with each other. The term "correspondence relationship" as used herein means a relationship between the client information file to be used and the individual information file to be used in combination with the client information file. An issue file is produced using the client information file and individual information file associated with the client information file, but in step 102, if the operator inputs mistakenly an individual information file, the issue file is not produced normally. Thus, in the client information file, there is preliminarily stored an individual information file name associated with the client information file, and the correspondence relationship is checked based on whether or not this file name agrees with the individual data file name inputted by the operator in step 102. If the correspondence relationship does not hold, a proper issue file is not provided, so the flow proceeds to step 204; if the correspondence relationship holds, the flow proceeds to step 205. Here, when a method is used in which the only operation is to input a client information file, and the appropriate individual information file is selected by the system based on the individual information file name having a correspondence relationship stored in the client information file, the inputting of individual information file in step 202, the checking of correspondence relationship in step 203 and the subsequent step 204 can be omitted. Alternatively, when a method is used in which the same code name is preliminarily attached to an individual information file having a correspondence relationship with the client information file so that the two are selected by specifying one code name, the above steps can also be omitted.

[0036]

In step 204, the operator is notified that the correspondence relationship does not hold, so that the operator conducts a proper operation.

[0037]

In step 205, selection of issue file production method is made for the host computer. In the "new-file method", a totally-new issue file is produced from the client information file and individual information file. The "existing issue file using method" is used, for example, in a case where there are left a part or all of the issue files used for the previous issue processings for the same client, and in the current processing, there is only a small difference of issue specifications, so if only information corresponding to the personal data file is modified, the production can be performed more efficiently than when newly produced.

[0038]

In step 206, the number Fp of issue files to be produced is determined based on the remaining memory capacity Mo and the memory occupation quantity Mf of one issue file. In step 207, issue files of the number Fp are produced on the main memory. In this case, there are produced only the issue files for which issue file production flag F of the corresponding individual data file has been set to a state of being "not yet issued". Then, after the issue file has been produced, the production flag is set to a state of being "already issued". The reason for provision of the production flag of individual data file is that, for example, when individual data files are supplied with multiple floppy disks and sequentially used to perform the issue processing, two or more of the same cards are unfailingly prevented from being issued as a result of an already-used floppy disk used by mistake. However, if different card identification information is preliminarily attached to each card and an issue file having one-to-one correspondence with such identification information is used, the above problem is prevented from occurring unless such identification information is doubly attached.

[0039]

In step 208, the number Ft of issue files to be produced is updated so that Ft = Ft - Fp. In step 209, the issue processing of each card is repeated a number Fp of times using the produced issue files of the number Fp. In this case, the host computer saves the processing result for each card and the other determination information as a history. The handling of shortage of card and that of the number Fq of issue files already produced but not yet used are basically similar to the above, and hence an explanation thereof is omitted.

[0040]

In step 210, since all the issue files to be used deployed on the main memory have been used, if there is no card for which the issue processing described until now has terminated abnormally, the flow proceeds to step 211; if there is a card for which the issue processing has terminated abnormally, the flow proceeds to step 212. Then, in step 211, a history of all the cards is outputted, and the flow proceeds to step 213. In step 212, only a history of error with respect to the card of abnormal termination is outputted and the flow proceeds to step 213. Here, the output content can be appropriately changed according to a command.

[0041]

In step 213, it is checked whether or not there is still an issue file to be produced but not yet produced on the main memory, i.e, Ft > 0. If there is no issue file to be produced but not yet produced, this means that all the issue processings are completed, so a sequence of the issue processings are completed; if there is an issue file to be produced but not yet produced, this means that the issue processing may be carried on, so the flow proceeds to the subsequent step 214.

[0042]

In step 214, the operator is notified that there is still an issue file to be produced but not yet produced, and a request is made to the operator to determine whether the issue file to be produced is actually produced to carry on the issue processing, or the issue file left due to abnormal termination is used to carry on the issue processing as a reissue processing, or the issue processing is terminated at this step, or the processing for the current client is terminated and the processing for another client is performed. In step 215, if the operator's command is of termination request, the processing is terminated at this step; if the operator requests that the processing be carried on, the flow proceeds to step 216, and if the processing for the current issue object (client) is to be carried on, the flow returns to step 206; if a new issue processing for another issue object (another client or the same client with different issue specification) is to be performed, the flow returns to step 201. Here, the reuse of the issue file of abnormal termination is basically similar to the above two examples, and an explanation thereof is omitted.

[0043]

In this way, a smooth issue operation with history output is implemented for a client selected from among multiple clients or a client replaced with another client in the middle of the processing. In the above example, there is described the case where each time all the issue files produced on the main memory are used, there is a wait until the operator gives a subsequent command. However, for example, the following method may be used; a command is preliminarily given so that a group of cards to be issued or a roughly selected number of cards are all successively processed and the notification to the operator and the history output are not performed until the required number of cards are issued.

[0044]

[Advantages of the Invention]

As described above in detail, the inventive issue processing system is considerably advantageous in that, even when the memory capacity of the main memory of the host computer used as a temporary storage area of information needed for the issue processing is limited, the issue processing with respect to many cards can be performed under the constraint thereof, and a flexible issue operation can be implemented, so that individual data files already used are prevented from being used by mistake and also switching can be appropriately performed between multiple issue objects.

[Brief Description of the Drawings]

[Figure 1]

Figure 1 is a view illustrating a basic procedure of issue processing by an issue processing system according to the present invention.

[Figure 2]

Figure 2 is a view (first half) illustrating an exemplary procedure of issue processing by the issue processing system according to the present invention.

[Figure 3]

Figure 3 is a view (latter half) illustrating an exemplary procedure of issue processing by the issue processing system according to the present invention.

[Figure 4]

Figure 4 is a view illustrating another exemplary procedure of issue processing by the issue processing system according to the present invention.

FIGURE 1

S1 DETERMINE, BASED ON REMAINING MEMORY CAPACITY AND MEMORY OCCUPATION QUANTITY OF ONE ISSUE FILE, THE NUMBER Fp OF ISSUE FILES TO BE PRODUCED ALL AT ONCE

S2 PRODUCE ISSUE FILE

S3 THERE IS SHORTAGE OF CARD?

S4 NOTIFY OPERATOR OF SHORTAGE OF CARD AND REQUEST COMMAND OF TERMINATING OR CARRYING ON PROCESSING

S5 TERMINATION REQUEST?

S6 PERFORM ISSUE PROCESSING BY USE OF ISSUE FILE

S7 ISSUE PROCESSING HAS TERMINATED NORMALLY

S8 DELETE APPROPRIATE ISSUE FILE

S9 THERE IS ANY ISSUE FILE NOT YET USED?

S10 THERE IS ANY ISSUE FILE NOT YET PRODUCED?

S11 NOTIFY OPERATOR OF PRESENCE OF ISSUE FILE TO BE PRODUCED AND REQUEST COMMAND OF TERMINATING OR CARRYING ON PROCESSING

S12 TERMINATION REQUEST?

FIGURE 2

S101 CHECK THE NUMBER Ft OF ALL NEEDED ISSUE FILES
CHECK MEMORY OCCUPATION QUANTITY Mf OF ONE ISSUE FILE

S102 CHECK REMAINING MEMORY CAPACITY Mo

S103 DETERMINE THE NUMBER Fp OF ISSUE FILES TO BE PRODUCED

S104 PRODUCE ISSUE FILES OF THE NUMBER Fp

S105 CALCULATE THE NUMBER OF REMAINING ISSUE FILES TO BE PRODUCED

$Ft = Ft - Fp$

S106 CHECK THE NUMBER Fq OF ISSUE FILES ALREADY PRODUCED BUT NOT YET USED

S107 SET ISSUE PROCESSING COUNTER P

$P = Fp + Fq$

FIGURE 3

S108 THERE IS NO SHORTAGE OF CARD?

S109 NOTIFY OPERATOR OF SHORTAGE OF CARD AND REQUEST COMMAND OF TERMINATING OR CARRYING ON PROCESSING

S110 TERMINATION REQUEST?

S111 RECEIVE CARD IDENTIFICATION INFORMATION FROM CARD PROCESSING MEANS

S112 ACCESS APPROPRIATE ISSUE FILE AND SEND IT TO CARD PROCESSING MEANS

S113 DECREMENT ISSUE PROCESSING COUNTER P

S114 CARD PROCESSING MEANS: PROCESSINGS OF WRITING AND THE LIKE, AND DISCHARGING AND HOLDING OF CARD

S115 RECEIVE PROCESSING RESULT FROM CARD PROCESSING MEANS

S116 ISSUE PROCESSING HAS TERMINATED NORMALLY?

S117 DELETE APPROPRIATE ISSUE FILE

S118 THERE IS ISSUE FILE NOT YET USED?

S119 THERE IS ISSUE FILE TO BE PRODUCED?

$Ft > 0?$

S120 NOTIFY OPERATOR OF PRESENCE OF ISSUE FILE TO BE PRODUCED AND REQUEST COMMAND OF TERMINATING OR CARRYING ON PROCESSING

S121 TERMINATION REQUEST?

FIGURE 4

S201 SPECIFY CLIENT

S202 SELECT APPROPRIATE CLIENT INFORMATION FILE AND INDIVIDUAL DATA FILE

S203 THE TWO FILES HAVE CORRESPONDENCE RELATIONSHIP WITH EACH OTHER?

S204 NOTIFY OPERATOR AND INTERRUPT PROCESSING

S205 SELECT ISSUE FILE PRODUCTION METHOD: NEW-FILE METHOD OR EXISTING ISSUE FILE USING METHOD

S206 DETERMINE THE NUMBER Fp OF ISSUE FILES TO BE PRODUCED BASED ON REMAINING MEMORY CAPACITY Mo AND MEMORY OCCUPATION QUANTITY Mf OF ONE ISSUE FILE

S207 PRODUCE ISSUE FILES OF THE NUMBER Fp (PRODUCE ISSUE FILES FOR WHICH ISSUE FILE PRODUCTION FLAG F OF INDIVIDUAL DATA FILE = "NOT YET ISSUED" AND CHANGE F TO F = "ALREADY ISSUED")

S208 CALCULATE THE NUMBER Ft OF ISSUE FILES TO BE PRODUCED

$$Ft = Ft - Fp$$

S209 PERFORM ISSUE PROCESSING USING ISSUE FILES OF THE NUMBER Fp

SAVE, AS A HISTORY, PROCESSING RESULT RECEIVED

FROM CARD PROCESSING MEANS

S210 THERE IS ANY CARD FOR WHICH ISSUE PROCESSING HAS TERMINATED ABNORMALLY?

S211 OUTPUT HISTORY OF ALL CARDS

S212 OUTPUT ONLY ERROR HISTORY

S213 THERE IS ANY ISSUE FILE TO BE PRODUCED?

Ft > 0?

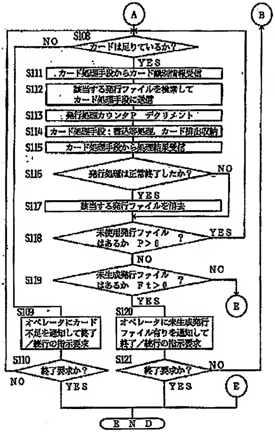
S214 NOTIFY OPERATOR OF PRESENCE OF ISSUE FILE TO BE PRODUCED AND REQUEST COMMAND OF TERMINATING OR CARRYING ON PROCESSING, OR PERFORMING ISSUE PROCESSING OF ANOTHER CLIENT.

S215 TERMINATION REQUEST?

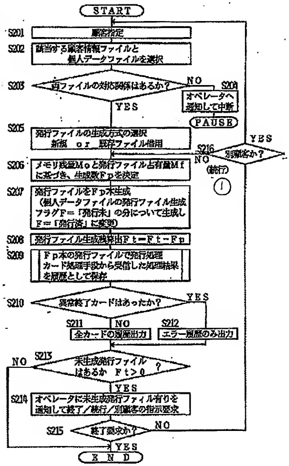
S216 ANOTHER CLIENT?

#1 (CONTINUE)

【図3】


A
B
S108
NO
カードは足りているか?
YES
S111
カード処理手段からカード識別情報受信
S112
該当する発行ファイルを検索して
カード処理手段に送信
S113
発行処理カウンタP　デクリメント
S114
カード処理手段：書込等処理，カード排出収納
S115
カード処理手段から処理結果受信
S116
発行処理は正常終了したか?
NO
YES
S117
該当する発行ファイルを消去
S118
未使用発行ファイル
はあるか　P＞0　?
YES
NO
S119
未生成発行ファイル
はあるか　Ft＞0　?
NO
E
YES
S109
オペレータにカード
不足を通知して終了
／続行の指示要求
S120
オペレータに未生成発行
ファイル有りを通知して
終了／続行の指示要求
S110
終了要求か?
NO
YES
S121
終了要求か?
NO
YES
E
E N D

【図4】


START
S201
顧客指定
S202
該当する顧客情報ファイルと
個人データファイルを選択
S203
両ファイルの対応関係はあるか?
NO
S204
オペレータへ
通知して中断
PAUSE
YES
S205
発行ファイルの生成方式の選択
新規　or　既存ファイル借用
S216
別顧客か?
YES
NO
(続行)
I
S206
メモリ残量Moと発行ファイル占有量Mf
に基づき、生成数Fpを決定
S207
発行ファイルをFp本生成
（個人データファイルの発行ファイル生成
フラグF＝「発行未」の分について生成し
F＝「発行済」に変更）
S208
発行ファイル生成残算出Ft＝Ft－Fp
S209
Fp本の発行ファイルで発行処理
カード処理手段から受信した処理結果
を履歴として保存
S210
異常終了カードはあったか?
YES
S211
NO
全カードの履歴出力
S212
エラー履歴のみ出力
S213
NO
未生成発行ファイル
はあるか　Ft＞0　?
YES
S214
オペレータに未生成発行ファイル有りを
通知して終了／続行／別顧客の指示要求
S215
終了要求か?
NO
YES
E N D